

## Quarterly Report – Public Page

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Project Title: Intrinsically Locatable Technology for Plastic Piping Systems

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### Project Scope

The scope of the project will be to develop an electronic marking system that will provide locatability to the target depths on various diameter high density polyethylene (HDPE) and medium density polyethylene (MDPE) for gas applications. The project will also assess the technology capabilities versus pipe diameter, burial depth, and pipe burial methods (horizontal directional drilling, open trench, etc.). Included in the marker development will be the development of a flexible housing to allow the solution to be adaptable to a wide range of pipe diameter sizes. The attachment method will be integrated into the plastic pipe manufacturer process and workflow. Laboratory and field evaluations will be performed to validate the system to be commercially viable as an intrinsically locatable PE piping system.

In order to evaluate the various marker housing attachment methods, the project team procured various types of PE pipes and fabricate prototypes of the marker housing with magneto-mechanical resonators. These markers were then attached to the PE pipes using the various attachment concepts described above. These PE pipe sections were then installed in GTI's pipe farm via horizontal directional drilling (HDD) installation methods. The pipes were trenchlessly installed through various types of soil in the pipe farm; silty, gravel, clay and sand based soils.

### Technical Status

During the current (fifth) quarter, the ILPP development team completed all the above stated task assessments successfully, finalizing the tag and carrier design with preliminary aging assessment results showing capability.

The team has identified appropriate attachment processes that are compatible with pipe extrusion processes as well as identifying and assessing the constraints.

Additional ILPP sections were assembled and tested with the harshest installation methods under various soil conditions, showing capability of the carrier, housing and attachment design.

Enhancements to the carrier design as well as housing design were incorporated, as part of continuous improvement process towards a more efficient and stronger solution. Hence, the deliverable has been met.

#### **Results and Conclusions:**

The project is progressing well with good assessment results for the flexible housing to meet the pipe's bend radius, type, size and installation methods were developed. The research team has developed various attachment methods and conducted several field tests using HDD installation methods in gravel, clay and sand soils of 1", 2", and 4" PE pipes with attached sensors.

#### **Plans for Future Activity:**

The next steps will consist of further evaluation and review of the various sensor attachment methods.

During the next quarter, the following activities will be conducted:

- Continue Task 4 efforts by fabrication of large number of tags and carriers for the field test as well as other QA tests. Attachment machines for welding as well as Mastic Tape application will be developed and constructed, to be used for assembling the ILPP samples for the field trials scheduled in July 2017.
- Continue Task 5 efforts by evaluating PE pipe samples with the integrated locating system in GTI's pipe farm on GTI property using various industry practices.